

MANAGEMENT OF ANTERIOR COMMISSURE CARCINOMA OF THE LARYNX*

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SUBTOTAL laryngectomies have been performed for more than 100 years. As then, so now, our goals in treatment of the patient with carcinoma of the larynx are: 1) to remove the cancer completely and 2) to preserve the function of the larynx in respiration, phonation, and deglutition.

Cancer involving the anterior commissure is unique because of the intimate relation between the anterior vocal cords, anterior commissure tendon, and thyroid cartilage. Broyles³ has shown that the anterior larynx does not contain a cushion of muscle between the cords and the thyroid cartilage as does the lateral larynx. One of the earliest and most frequent breakthroughs for carcinoma of the larynx is in the anterior mid-line. Because of this, it is recommended that bilateral thyrotomy be performed in treating lesions that involve the anterior commissure.

INDICATIONS FOR VERTICAL PARTIAL LARYNGECTOMY

- 1) Involvement of both cords and anterior commissure.
- 2) Subglottic extension of no more than 1 cm.; this should be anterior or anterolateral extension.
- 3) Vocal cords should be mobile, but slight limitation of motion is not a contraindication provided the limitation is not due to subglottic extension.
- 4) Absence of hair over the thyroid cartilage, if the full-thickness cervical skin flap is used for reconstruction.

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CONTRAINDICATIONS

- 1) Invasion of the thyroid cartilage.
- 2) Lesions of the posterior commissure.
- 3) Subglottic extension greater than 1 cm.
- 4) Irradiated cases: some are amenable to vertical partial laryngectomy provided the recurrence is not subglottic.
- 5) Vocal-cord fixation.

Preoperative study includes indirect laryngoscopy followed by laryngograms which are helpful in assessing the extent of the subglottic extension and involvement of the anterior commissure when the lesion is bulky. Then direct laryngoscopy is completed in order to confirm the diagnosis and to ratify the staging of the disease.

Two types of carcinoma involve the anterior commissure: 1) a lesion originating on the anterior aspect of one vocal cord crossing the anterior commissure to involve a few millimeters of the opposite cord and 2) a more extensive lesion that involves one membranous cord, the vocal process of the arytenoid, the anterior commissure, and half of the opposite cord. For the first tumor presentation, it is desirable to use bilateral vertical thyrotomy; the anterior commissure is excised with its attached thyroid cartilage along with a subperichondrial resection of most of the involved cord and a smaller amount of the opposite cord. Reconstruction is carried out by sewing the remnant of the opposite cord anteriorly and then mobilizing a flap of mucous membrane from the aryepiglottic fold and pyriform fossa to cover the denuded side of major resection. Insertion of a keel is not necessary under these circumstances. However, if enough mucosa cannot be obtained to cover the interior of the larynx, a keel is inserted to avoid stricture and allow for reepithelialization of the larynx. Som² has presented a good analysis of this. To provide bulk, Bailey¹ preserves the external perichondrium and sutures it to a bipedicle sternohyoid muscle flap that is then used to reconstruct the interior of the larynx.

In treating the second type of lesion, the surgeon must resect all of one vocal cord and a major portion of the other cord along with a similar amount of thyroid cartilage. This causes loss of major support for an adequate laryngeal lumen and produces a mucosal defect that cannot be corrected by mobilization of mucous membrane from the aryepiglottic fold and pyriform fossa. Conley⁴ has described bilateral

full-thickness cervical skin flaps for reconstruction of the larynx, leaving the patient with a temporary laryngostome, or doing a primary closure in conjunction with an epithelial shave.

TECHNIQUE

1) Preliminary tracheotomy under local anesthesia; a horizontal incision is used.

2) Hairless regional flaps composed of skin, subcutaneous tissue, and platysma muscle are designed.

3) The strap muscles are preserved for support and to maintain the anterior-posterior diameter of the larynx.

4) The strap muscles are elevated away from the thyroid cartilage to the level of the posterior lamina.

5) A horizontal incision is made through the cricothyroid membrane along the superior aspect of the cricoid. The vertical and oblique sections of the cricothyroid muscle are cut.

6) The perichondrium and thyroid cartilage are incised on the opposite side of the lesion, far enough posteriorly to insure adequate resection of the tumor. Visualization of the interior of the larynx is done at steps 5 and 6.

7) An incision is made into the thyrohyoid membrane at the level of the superior aspect of the thyroid cartilage.

8) The thyroid cartilage on the side of the lesion is cut posteriorly, the posterior lamina is preserved, with the attachment of the constrictor muscle. The arytenoid on the involved side is removed and then a juncture is made with the incision already mentioned.

9) The mucosa is incised posteriorly in the mid-line to remove the specimen.

10) Tissue taken from the margins should be examined by frozen section.

11) The flaps should be rotated and the interior of the larynx reconstructed.

12) The laryngostome is closed in six weeks, or epidermal shave and primary closure are done.

Advantages derived from use of a regional pedicle flap for reconstruction of the interior larynx include: 1) minimal contracture, 2) assured viability, and 3) better quality of voice.

Extensive subtotal resection of the larynx is possible; merely one

arytenoid must be preserved, yet physiologic integrity is maintained.

The disadvantage is that recurrent cancer may not be readily appreciated as it may invade the under surface of the flaps. However, if proper preoperative study is done and the principles outlined are followed, this should be no problem.

POSTOPERATIVE MANAGEMENT

- 1) Laryngostome bolus is removed on the fifth to ninth postoperative day.
- 2) Feeding by mouth is started at this time.
- 3) Tracheal decanulation is not completed until the laryngostome is closed. Once the bolus is removed, the tracheotomy can be corked.
- 4) Aspiration is not a problem.
- 5) As in dealing with other patients with carcinoma, very close systematic follow-up is mandatory.

Kirschner⁵ reported on the use of radiation treatment in treating glottic carcinoma that extends from one cord to the other across the anterior commissure and came to the conclusion that radiation was curative in only 40% of patients because:

- 1) The anterior commissure has a poor blood supply and is intimately attached to the thyroid cartilage; this renders it liable to radiation damage.
- 2) Because of the acuteness of the angle of union of the two halves of the thyroid cartilage in the mid-line, it receives the largest dose of radiation when the larynx is cross-fired from each side.
- 3) Recognizing these two conditions, the therapist may attempt to compensate and treat the anterior commissure inadequately.

Many authors have reported statistics for tumor control in patients undergoing hemilaryngectomy. Biller⁶ reviewed a large series of patients and reported a three-year tumor-control rate of 77%. Other authors have also reported figures in the 70 to 80% range for this type of procedure.

SUMMARY

An operation for rehabilitation of the glottis in extended subtotal laryngectomy is presented. The advantages of this procedure are: a reduction in distortion and scar-tissue contraction of the glottic wound, the patency of the airway system is reaffirmed, and the quality of the

voice is improved. This may be observed when comparison is made with procedures in which less tissue is used for reconstruction.

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